(19) World Intellectual Property **Organization**

International Bureau





(43) International Publication Date 16 June 2005 (16.06.2005)

PCT

(10) International Publication Number WO 2005/054746 A3

(51) International Patent Classification⁷: E21B 43/24, C02F 1/04

F22B 1/08,

(21) International Application Number:

PCT/US2004/039515

(22) International Filing Date:

24 November 2004 (24.11.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/525,578

26 November 2003 (26.11.2003) US

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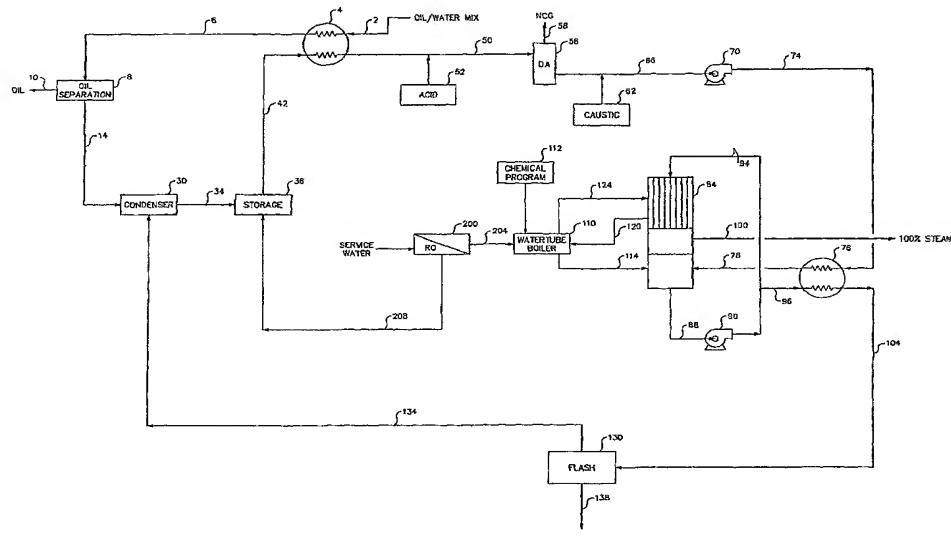
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- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE,

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(54) Title: METHOD FOR PRODUCTION OF HIGH PRESSURE STEAM FROM PRODUCED WATER



(57) Abstract: An evaporation based method for generation of high pressure steam from produced water in the heavy oil production industry. De-oiled produced water is processed through a high pH/high pressure evaporator (84) driven by a commercial watertube boiler (110). The vapor produced by the evaporator is suitable for the steam assisted gravity drainage (SAGD) method being utilized by heavy oil recovery installations, without the use of once through steam generators that require extensive chemical treatment, and without requiring atmospheric distillation, which requires high power consuming compressors. Evaporator blowdown may be further treated in a crystallizing evaporator to provide a zero liquid discharge (ZLD) system and, with most produced waters, at least 98% of the incoming produced water stream can be recovered in the form of high pressure steam.

WO 2005/054746 A3



SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report:

18 August 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.